AMENDMENTS TO THE CLAIMS

1. (Currently amended) A composite membrane consisting of a porous substrate and a porous separation layer which consists of a zeolithe of the MFI type, wherein the separation layer is produced by a hydrothermal synthesis in which the molar ratio of silicon to aluminum in the synthesis solution is greater than 120 and the substrate contains less than 10% by weight of aluminum in elemental or chemically bound form in a zone of at least 100 nm adjacent to the separation layer, and wherein the molar ratio of silicon to aluminum in the separation layer is greater than 120 and the substrate material has an asymmetrical structure wherein the substrate is selected from the group consisting of steel, sintered metals, titanium oxide, titanium oxide on alumina, silica, zirconium dioxide and magnesium oxide.

2. (Original) A composite membrane according to claim 1, wherein the substrate is a body having penetrating pores having a pore diameter of from 5 nm to 3 μm.

3. (Cancelled)

4. (Original) A process for the production of a composite membrane comprising at least one porous substrate and at least one porous separation layer wherein the separation layer contains at least one zeolithe of the MFI type and the molar ratio of silicon to aluminum in the separation layer is greater than 120 and wherein the substrate contains less than 10% by weight of aluminum in elemental or chemically bound form in a zone of at least 100 nm adjacent to the separation layer and the substrate material has an asymmetrical structure, comprising the following process steps:

(a) hydrothermal synthesis of a synthesis solution, in which the molar ratio of silicon to aluminum is greater than 120, on a substrate by bringing the substrate into contact with the synthesis solution over a period of from 1 to 100 hours at from 100 to 250°C,

(b) washing of the membrane resulting from process step (a) with water or an acidic solution for a period of from 5 to 120 minutes,

(c) drying of the membrane at from 5 to 40°C over a period of from 1 to 100 hours in the presence of a flowing or stationary gas,

(d) calcination of the membrane at a heating rate of from 0.1 to 1 K/min up to a temperature of from 200 to 600°C, residence being effected at the final temperature for from 30 to 500 minutes and then cooling being effected at a rate of 0.1 K/min to 10 K/min.

5. (Original) A process according to claim 4, wherein the substrate material used in process step (a) is subjected, before the hydrothermal synthesis, to a seeding step in which a layer of seed particles which at least partly covers that side of the substrate which is to be coated is applied to said side.

6. (Previously presented) A process according to claim 4, wherein, in the hydrothermal synthesis of the synthesis solution on the substrate, access of the synthesis solution to the surface not to be coated or to the surfaces of the substrate which are not coated is substantially prevented by a medium which is present in the pores of the substrate and on the surface not to be coated or the surfaces not to be coated.

7. (Previously presented) A process for separating olefin-containing mixtures in at least one membrane apparatus, comprising at least one membrane, in which the olefin-containing mixture flows into the membrane apparatus, is brought into contact with the at least one membrane and is separated into a stream passing through the membrane and a stream not passing through the membrane, wherein a composite membrane according to claim 1 is used in the process.

8. (Original) A process according to claim 7, wherein the separation is carried out at from 20 to 200°C.

9. (Previously presented) A process according to claim 7, wherein, in the separation of the olefin-containing mixture, the pressure on the permeate side of the membrane is from 0.01 to 10 bar (abs) and/or the pressure on the retentate side of the membrane is higher than on the permeate side.

10. – 11. (Cancelled)

12. (Previously presented) A process according to claim 7, wherein the olefin containing mixture comprises isomeric butenes.

13 – 16. (Cancelled)